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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/372,331	08/11/1999	NIKOLAI NEFEDOV	297-008769-U	1278

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CLARENCE A GREEN
PERMAN & GREEN
425 POST ROAD
FAIRFIELD, CT 06430

EXAMINER	
CHANG, EDITH M	
ART UNIT	**PAPER NUMBER**
2634	17

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/372,331	NEFEDOV, NIKOLAI	
	Examiner	Art Unit	
	Edith M Chang	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-10 and 12-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-10 and 12-14* is/are allowed.

6)☒ Claim(s) *15-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *Aug 11 1999* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

The final rejection is withdrawn in view of the newly discovered reference(s). Rejections based on the cited references follow.

Drawings

The drawings are objected to because in Fig.1 the elements are not labeled, it suggests adding "delay" to 102-104, "weighting coefficient" to 105-108; in Fig.3 it suggests adding "delay" to 301-302, and 308. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sturza et al. (US Patent 6157642) in view of Kobayashi et al. (US Patent 6029264), Benedetto et al. (Serial Concatenation of Interleaved Codes: Performance Analysis, Design, and Iterative Decoding, IEEE Transactions on Information Theory, Vol. 44, No. 3, May 1998).

Regarding claim 15, Sturza et al. discloses a method for transmitting digital information in the form of consecutive symbols over a transmission channel (Fig.6), comprising the successive steps of: a) encoding the digital information to be transmitted with an outer convolutional code (72, 73 Fig.6; column 8 lines 60-65), b) interleaving the encoded digital information (74-76 Fig.6), c) encoding the interleaved encoded digital information with a recursive inner code (77 Fig.6; column 7 line 64-column 8 line 7) and modulating the encoded interleaved encoded digital information onto a carrier (79 Fig.6), and d) transmitting the carrier containing modulated encoded interleaved encoded digital information (81 Fig.6). Sturza suggests the selection of the encoding scheme will depend on the errors introduced in the links (column 10 lines 38-41) and the outer encoder may be a convolution or trellis encoder (column 8 lines 62-64), however does not chose the convolution outer encoder as the preferred one and does not specify the modulation method.

Concerning the convolution outer encoder, Benedetto et al. teaches a SCCC (Serially Concatenated Convolutional Codes) with a convolutioal outer code in the Fig.5 of their May 1998 paper is preferred to SCBC (Serially Concatenated Block Code). Therefore, the use of Benedetto et al.'s convolutional outer code in Sturza et al.'s outer encoder would have been evident to one of the ordinary skill in the art at the time the invention was made, since it has been taught by Benedetto et al. that the use of convolutional code as the outer encoder would have greater interleaver gain and code performance (page 914, 1st column, section III).

Concerning the modulation method, Kobayashi et al. teaches the memoryless modulation (e.g. PSK, column 3 lines 5-11) for an intersymbol interference channel (column 2 lines 8-30). At the time the invention was made, it would have been evident to one of the ordinary skill in the

art to have the modulation technique taught by Kobayashi et al. in Sturza et al.'s modulation to have a wide bandwidth which Sturza et al wants to achieve (column 1 lines 60-65 '642), and Kobayashi et al.'s modulation provides.

Regarding claims 16-17, further Kobayashi et al. teaches the recursive inner code is a differential code. Kobayashi et al.'s concatenated system has an inner encoder and modulator as an integrated structure (Fig. 4. and column 5, lines 6-8), and the differential code for modulation (column 3, lines 5-10) to minimize unknown/time-varying channel interference (column 3, lines 12-16). From Kobayashi et al.'s teaching, it has been obviously to a person of ordinary skill in the art at the time the invention was made to have the inner encoder using the differential code its differential modulation in Sturza et al.'s inner coder and modulation to provide good performance under a wide variety of channel conditions (column 3 lines 5-25).

Regarding claim 18, further Benedetto et al. teaches the outer coder is a serial concatenated convolutional code (Abstract, where the construction can be generalized to h cascaded encoders; page 913 Fig.5 Section C). At the time the invention was made, it would have been evident to one of the ordinary skill in the art to have a serial concatenated convolutional code taught by Benedetto et al. in Sturza et al.'s outer encoder to have better performance (less error).

Allowable Subject Matter

3. Claims 1, 3-10, and 12-14 are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 703-305-3416. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4800.

Edith Chang
September 25, 2003

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600